PE TITLE: Threat Simulator Development

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

February 1999

BUDGET ACTIVITY

PE NUMBER AND TITLE

6 - Management and Support

0604256F Threat Simulator Development

	- 11										
	COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
	Total Program Element (PE) Cost	52,267	34,086	32,391	36,848	38,260	40,293	43,025	43,914	Continuing	TBD
3321	Electronic Warfare Ground Test Resources	50,796	32,189	28,062	28,724	29,324	31,167	33,656	34,329	Continuing	TBD
2907	Electronic Combat Intel Support	1,471	1,897	1,939	1,985	1,898	1,930	2,053	2,075	Continuing	TBD
7500	Foreign Materiel Acquisition/Exploitation	0	0	2,390	6,139	7,038	7,196	7,316	7,510	Continuing	TBD
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description: This PE provides funding for the elements necessary to support the AF Electronic Warfare (EW) Test Process. This test process provides a scientific methodology to ensure the effective disciplined and efficient testing of AF EW and avionics systems. Each capability or facility improvement is pursued in concert with the others so as to avoid duplicate capabilities while at the same time producing the proper mix of test resources needed to support the AF EW Test Process. This PE provides funding for the management and technical oversight of implementation activities, the Air Force-led tri-Service effort to establish a common modeling and simulation architecture, development and improvement of digital EW models, measurement facilities operation and improvements, hardware in the loop test facilities operation and improvements, installed system test facility improvements, and development and improvement of open air threat simulators for flight testing. This PE also provides funding for planning, management, budgetary, and technical support to the Air Force for corporate-level implementation of the Electronic Warfare (EW) Test Process and for improvement and modernization (I&M) and application of the test and evaluation (T&E) infrastructure. Support includes requirements definition and analysis, project planning, programming and budgeting, technical oversight, and application of T&E facility I&M. Products include studies, analyses, and related documentation. This PE provides funding to support the acquisition and exploitation efforts of the Foreign Materiel Program, as well as to support EW intelligence efforts, beginning in FY 90. In FY 98, Projects 6510, Flight Test Resources, and 2900, RATSCAT Upgrade, were combined into Project 3321, Electronic Warfare Test Resources, as part of consolidation and simplification efforts in T&E investment accounts. Contracts funded from this program are predominately awarded on the basis of full and open competition. This Program Element is in Budget Acti

(U) **B.** <u>Budget Activity Justification:</u> This Program Element is in Budget Activity 6, Management Support, because it is a Research and Development (R&D) effort for Improvement and Modernization of EW related T&E capabilities at Air Force Test Centers.

Page 1 of 12 Pages

Exhibit R-2 (PE 0604256F)

RDT&E BUDGET ITEM JUS	STIFICATIO	N SHEET (R-2 Exhibit	t)	February 1999		
BUDGET ACTIVITY		PE NUMBER AND					
6 - Management and Support		0604256F	Threat Simu	lator Development			
U) C. Program Change Summary (\$ in Thousands)		-					
					Total		
	FY 1998	FY 1999	FY 2000	FY 2001	Cost		
(U) Previous President's Budget (FY 1999 PB)	51,501	32,582	37,400	39,561	Continuing		
(U) Appropriated Value	54,346	34,582	37,100	33,301	Communing		
(U) Adjustments to Appropriated Value	3 1,3 10	31,302					
a. Cong Adjustments	-3,200	-497					
b. SBIR	0	.,,					
c. Omnibus or Other Above Threshold Reprogram	-346						
d. Below Threshold Reprogramming	4,312						
(U) Adjustments to Budget Years Since FY 1999 PB	-,		-5,009	-2,713			
(U) Current Budget Submit/FY 2000 PB	52,267	34,086	32,391	36,848	Continuing		
U) FY99: \$679 has been idenfied as a source for SBIR.							
		ge 2 of 12 Pages			Exhibit R-2 (PE 0604256F)		

RDT&E BUDGET ITI	DATE Fe	February 1999								
BUDGET ACTIVITY 6 - Management and Support								PROJECT 3321		
COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
3321 Electronic Warfare Ground Test Resources	50,796	32,189	28,062	28,724	29,324	31,167	33,656	34,329	Continuing	TBD

(U) A. Mission Description: The AF requires a comprehensive set of test facilities to implement the Air Force Electronic Warfare (EW) Test Process. In order that program risk can be managed effectively throughout the weapon system acquisition process, and test and evaluation (T&E) be conducted effectively and efficiently, a spectrum of T&E capabilities from modeling and simulation through open-air ranges is required. The EW Test Process Support task provides for investment management, coordinated technical oversight, and application of EW T&E facilities, including studies, analyses, and related documentation. The Joint Modeling and Simulation System (JMASS) is an Air Force-led, tri-service project to establish a common, DoD-wide, digital simulation architecture and set of models in support of T&E. The current JMASS program supports model development to meet the needs of the B-1B Defensive System Upgrade Program (DSUP). The JMASS program currently includes development of a limited set of threat and environment models to support acquisition and test of multiple programs including the B-1B, F-22, and Joint Strike Fighter (JSF). Included in the JMASS program, the EW T&E M&S project develops threat models specifically to support T&E requirements. In FY99 the Joint Program Office will be established for JMASS and in FY00 the funding for the JMASS architecture and software development will transition to PE 27601F and the JMASS compliant, digital EW model development activities required to support T&E customers will remain in this PE. The Radar Target Scatter (RATSCAT) upgrade project provides improvements to the RATSCAT measurement facility at Holloman AFB, NM to support radar cross section (RCS) measurement requirements of DoD customers with either conventional or stealth systems. The Hardware in the Loop (HITL) test facilities evaluate electronic support and countermeasures effectiveness prior to installation on the aircraft. Together, the two AF HITL facilities, the Air Force Electronic Warfare Evaluation Simulator (AFEWES) and the Real Time Electromagnetic Digitally Controlled Analyzer and Processor (REDCAP), provide the ability to realistically evaluate hardware components against manned hardware threat representations early enough to affect final system design. FY98 was the last year of T&E infrastructure funding for operations at the government-owned-contractor-operated REDCAP facility in Buffalo, NY. In subsequent years, REDCAP test functions will transition to the Digital Integrated Air Defense System (DIADS) HITL at Edwards AFB, CA. The Electronic Combat Integrated Test (ECIT) project upgrades the AF Installed System Test Facility (ISTF) at Edwards AFB, CA. This ISTF consists of a large, instrumented, anechoic chamber which provides for evaluation of an EW system when installed on its host aircraft, both prior to and throughout the flight test program. The goal of the ECIT upgrade is to integrate coherent EW threat stimulators into the ISTF. The Advanced Airborne Interceptor Simulator (AAIS), a project to develop an advanced signal system to represent airborne threats for EW open-air testing, was terminated in FY98 because of the availability of Foreign Material Acquisition assets capable of meeting primary customer requirements. Also in FY 98, Projects 6510, Flight Test Resources, and 2900, RATSCAT Upgrade, were combined into Project 3321, Electronic Warfare Test Resources.

Project 3321 Page 3 of 12 Pages Exhibit R-2A (PE 0604256F)

	T&E BUDGET ITEM JUSTIFIC	CATION SHEET (R-2A Exhibit)	February 1999
GET ACTIVITY Management	and Support	PE NUMBER AND TITLE 0604256F Threat Simulator Development	ent PROJEC
	Сирроп		
(U) <u>FY 1998 (\$ ir</u>			
- (U) \$1,825		rements analyses and other studies in support of Air Force investm	
		stance (SETA) support for Air Force implementation of the EW Te	st Process, including
(II) \$12.400	improvement and modernization (I&M) of the		
- (U) \$12,489	• •	a joint version of the JMASS software. Adapted JMASS to a wide JMASS efficiency by optimizing the architecture. Adapted com	
		oost-processing viewing and analysis. Operated and maintained EV	
		compliant models of surface-to-air missiles (SAMs), Air-to-Air M	
		test of multiple programs, including the B-1, F-22, and Joint Strik	
		W T&E M&S) continued developing threat models required by Do	
	Test Process.		11
- (U) \$1,973	RATSCAT Upgrades. Integrated mobile Bis	static Coherent Measurement System (BICOMS) radar with BICO	MS control and instrumentation
		on of RATSCAT Advanced Measurement System (RAMS) radar r	*
- (U) \$3,525		d AFEWES operation in support of Air Force, Army, Navy, and n	
		V HITL simulator modifications. Upgraded the RF clutter environ	ment to better simulate the ope
~~	air range and integrate a semi-active SAM si		
- (U) \$4,912		Air Defense System (IADS) HITL capability from REDCAP, Buffa	
		I IADS (DIADS) HITL capability for support of Air Force, Army, orne Warning Model and Advanced C ³ Upgrade, and began develo	
	configurations. Began integration with ECI		pment of additional IADS
- (U) \$22,144	0 0	ure and generic test capabilities (I>C) for EW and avionics inst	talled system testing. Conduc-
(Θ) ψ22,111		GTC subsystems including Network and Controls, Simulation, Radi	
	and Injection, RF Free Space Excitation, and		orrequency (ray concrumon
- (U) \$3,928	AAIS. Paid termination costs of canceled pr		
- (U) \$50,796	Total		

Page 4 of 12 Pages

Exhibit R-2A (PE 0604256F)

Project 3321

DGET ACTIVITY - Management	and Support	0604256F Threat Simulator Development	3321
FY 1999 (\$ i	n Thousands): EW Test Process Support. Conduct requirements analysis	ses and other studies in support of Air Force investments in EW test	infrastructure.
- (U) \$8,149	software, which affords compatibility with the DoD Hig	gh-Level Architecture (HLA). Complete transition of JMASS to PCs	and other compute
	compliant SAM, AAM, and AI models to support the n	needs of a single customer. The EW Test and Evaluation Modeling ar	nd Simulation (EW
	Specifically EW T&E M&S will complete development	t of the JMASS RF enviornment model, complete development of the	SADS 2b/f, begin
- (U) \$1,863	upgrade range charactorization and mainsite UHF/VHF AFEWES Operation. Continue AFEWES operation in s	F upgrade. support of Air Force, Army, Navy, and non-DoD test customers. Con	ntinue developmen
- (U) \$6,191	1	velopment of external linking and BLUE IADS capabilities. pabilities (I>C), which provides RF generation capability in support	ort of F-22
	and the CTEIP-funded Generic Radar Target Generator	r (GRTG), Infrared Sensor Simulator (IRSS), and Communications-N	Navigation-
- (U) \$ 641 -(U)\$32,189			

RI	DT&E BUDGET ITEM JUSTIFICATION	SHEET (R-2A Exhibit)	DATE Feb i	ruary 1999
BUDGET ACTIVITY 6 - Management	and Support	PE NUMBER AND TITLE 0604256F Threat Simulator I	Development	PROJECT 3321
(U) <u>FY 2000</u> (\$ i	n Thousands):			
- (U) \$ 884	EC Test Process Support. Conduct requirements analys Provide systems engineering/technical assistance (SETA improvement and modernization (I&M) of the EW test	A) support for Air Force implementation of		
- (U) \$4,037	EW Test and Evaluation Modeling and Simulation (EW customers to support the EW Test Process. Continue de			
- (U) \$2,003	RATSCAT Upgrades. Achieve FOC for RAMS Pylon. characterization and mainsite UHF/VHF upgrade.	Complete industry partnership efforts with	th first major EW supplier.	Continue range
- (U) \$5,908	AFEWES. Continue AFEWES operation in support of Advance Simulator Modifications (SAM-C2), and begin			
- (U) \$2,835	DIADS. Continue support to Air Force, Army, Navy, at BLUE IADS capabilities. Begin support of major OT or			g via HLA and
- (U) \$12,395	ECIT. Complete Test Control and Integration (TC&I) s (IFAST). This effort includes integration of the CTEIP and Communications-Navigation-Identification (CNI) s	ub-system to be integrated into the Integra -funded Generic Radar Target Generator	ation Facility for Avionics S (GRTG), Infrared Sensor S	
-(U) \$28,062	Total	minuted into it 716 I to support I 22 requ	mements.	
(U) FY 2001 (\$ i	n Thousands):			
- (U) \$ 903	EC Test Process Support. Conduct requirements analys	es and other studies in support of Air Ford	ce investments in EW test in	nfrastructure.
\	Provide systems engineering/technical assistance (SETA improvement and modernization (I&M) of the EW test	A) support for Air Force implementation of		
- (U) \$3,989	EW Test and Evaluation Modeling and Simulation (EW customers to support the EW Test Process. Complete de		digital threat models require	ed by DoD
- (U) \$1,705	RATSCAT Upgrades. Enhance efficiency of operations suppliers. Complete updated range characterization efforts			lustry EW
- (U) \$7,940	AFEWES. Continue AFEWES operation in support of advanced simulator modifications (SAM-C2). Continue development of a second advanced RF semi-active SAM	Air Force, Army, Navy, and non-DoD test development of advanced RF semi-active	customers. Complete devel e SAM simulations (SAM-l	•
- (U) \$3,478	DIADS. Continue support to Air Force, Army, Navy, at BLUE IADS capabilities. Continue support of major O'M&S air warfare mission simulations.	nd non-DoD test customers. Continue dev	elopment of external linking	•
- (U) \$10,709	ECIT. Integrate the Test Control and Integration (TC&I (ISTF). This effort includes integration of the CTEIP-fu Communications-Navigation-Identification (CNI) simu	unded Generic Radar Target Generator (G	RTG), Infrared Sensor Stin	
Project 3321	Page	e 6 of 12 Pages	Exhibit R-2A (PE 06	604256F)

	DATE February 1999	•
BUDGET ACTIVITY	PE NUMBER AND TITLE	
6 - Management and Support	0604256F Threat Simulator Development	
-(U) \$28,724 Total	•	

RDT&E BUDGET IT	PATE February 199	99				
BUDGET ACTIVITY 6 - Management and Support		PE NUMBER . 0604256	AND TITLE F Threat Simula	tor Developme	ent 33	321
В		<u> </u>				
(U) Significant Program Changes: FY 2000 and	FY 2001 reductions	to fund other Air Force of	or DoD requirements.			
(U) C						
Appropriation: RDT&E	FY 1998	FY 2000	FY 2002	FY 2004	To	Total
Program Title: Central Test and Evaluation	39,643				N/A	
Related RDT&E:						
(U) PE 0604735F, Combat Training Ranges						
(U) Acquisition Strategy (U)						
		Page 7 of 12 Page	es			

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BUDGET ACTIVITY 6 - Management and Support						PE NUMBER AND TITLE 0604256F Threat Simulator Developm					lopm	PROJECT 3321				
(U) E. Schedule Profile																
 (U) JMASS 3.2 Release (U) Establish JMASS JPO (U) ECIT Infrastructure and Generic Test Capability (I&GTC) IOC (U) ECIT SIL Integration (U) ECIT BAF Integration (U) Digital Integrated Air Defense System Baseline IOC (U) AAIS Program Terminated 	1 *	<u>FY</u> 2	<u>1998</u> 3	4	1 X	<u>FY</u> 2	1999 3 X	4	1 X	2	<u>2000</u> 3	4	1	FY 2 2	3 X	4
(U) AFEWES SAM-C Upgrade (U) AFEWES SAM-E Dev Complete										X		X				
 (U) AFEWES SAM-F Dev Complete (U) EW T&E M&S Threat Models		*	*	X X	X	X			X			X				X X
 (U) RAMS Pylon Full Operational Capability (FOC) (U) RATSCAT - Upgrade Range Charactorization (U) RATSCAT Mainsite UHF/VHF Upgrade 						X	X	X						X		+
Project 3321					Paga	e 8 of 12	Pages					Exhibit	R-2A (I	PE 0604	1256F)	

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)										999
BUDGET ACTIVITY 6 - Management and Support		NUMBER AND 604256F 7		mulator [Developm	nent	PROJECT 2907			
COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
2907 Electronic Combat Intel Support	1,471	1,897	1,93	1,985	1,898	1,930	2,053	2,075	Continuing	TBD

(U) A. <u>Mission Description</u> This project provides funding to support Foreign Materiel Operational Test and Evaluation (FMOT&E), which ensures the ability of operational commands to test and develop effective Electronic Attack/Electronic Protection (EA/EP) and tactics. Funds are required for: deployment of blue systems to test facilities, travel for personnel to the test sites to evaluate and validate test results real-time, reimbursement for range and laboratory costs; costs for instrumentation of blue systems; contracted engineering support for the conduct of tests and subsequent reporting. Funding for this program is required to prevent future aircraft losses due to improper and ineffective aircrew tactics (e.g., lack of evasive action or proper tactics training to avoid missile attack).

(U) FY 1998 (\$ in Thousands):

- (U) \$1,180 Funded fighter and bomber testing for foreign material operational exploitation. Extensive evaluations and reporting was accomplished.
- (U) \$ 250 Funded transport aircraft for foreign material operational exploitation. Extensive evaluations and reporting was accomplished.
- (U) \$ 41 Funded classified operational assessments for foreign material operational exploitation. Extensive evaluations and reporting was accomplished.
- (U) \$1,471 Total

(U) FY 1999 (\$ in Thousands):

- (U) \$1,508 Funds fighter and bomber testing for foreign material operational exploitation. Extensive evaluations and reporting to be accomplished.
- (U) \$ 290 Funds transport aircraft for foreign material operational exploitation. Extensive evaluations and reporting to be accomplished.
- (U) \$ 61 Funds classified operational assessments for foreign material operational exploitation. Extensive evaluations and reporting to be accomplished.
- (U) \$ 38 Identified as source for SBIR
- (U) \$1,897 Total

(U) FY 2000 (\$ in Thousands):

- (U) \$1,557 Funds fighter and bomber testing for foreign material operational exploitation. Extensive evaluations and reporting to be accomplished.
- (U) \$ 319 Funds transport aircraft for foreign material operational exploitation. Extensive evaluations and reporting to be accomplished.
- (U) \$ 63 Funds classified operational assessments for foreign material operational exploitation. Extensive evaluations and reporting to be accomplished.
- (U) \$1,939 Total

Project 2907 Page 9 of 12 Pages Exhibit R-2A (PE 0604256F)

RDT&E BUDGET ITEM JUSTIFICATION	I SHEET (R-2A Exhibit)	February 1999
BUDGET ACTIVITY 6 - Management and Support		2907
FY 2001 (\$ in Thousands): - (U) \$1,570 - (U) \$ 344 Funds transport aircraft for foreign material operationa Funds classified operational assessments for foreign material operational assessment for foreign materia		
(U) B: Significant Program Changes:		
(U) C. Other Program Funding Summary (\$ in Thousands) None.		
(U) <u>Acquisition Strategy</u> :		
(U) E. Schedule Profile Not applicable.		
Project 2007	Evhikit	P 24 (PE 06042565)
Project 2907	Exhibit	R-2A (PE 0604256F)

RDT&E BUDGET I	February 1999									
BUDGET ACTIVITY 6 - Management and Support				NUMBER AND 604256F 7		PROJECT 7500				
COST (\$ In Thousands) FY 1998 Actual		FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
7500 Foreign Materiel Acquisition/Exploitation	0	0	2,39	90 6,139	7,038	7,196	7,316	7,510	Continuing	TBD

- (U) A. <u>Mission Description:</u> This project is established for the specific purpose of supporting the USAF Foreign Materiel Program in the acquisition and exploitation of foreign materiel. Items considered for these Foreign Materiel Acquisition and Exploitation (FMA&E) funds are included in the prioritized Air Force Foreign Materiel Acquisition (FMA) list established each year. The USAF FMA list is established annually by Major Command representatives using specific criteria and a well-established process. The draft list is then approved by each Major Command, and final approval comes from the Air Force Vice Chief of Staff. Exploitations are based on and driven by acquisitions.
 - (U) FY 1998 (\$ in Thousands): Not applicable.
 - (U) FY 1999 (\$ in Thousands): Not applicable.
 - (U) FY 2000 (\$ in Thousands):
 - (U) \$ 1,792 Funds the acquisition of Foreign Materials IAW the prioritized Air Force Foreign Material Acquisition list; subject to assets availability.
 - (U) \$ 359 Funds the exploitation of acquired Foreign Materials IAW prioritized lists and specific exploitation plans.
 - (U) \$ 239 Funds the operations and maintenance of the specialized Foreign Material assets.
 - (U) \$2,390 Total
 - (U) <u>FY 2001</u> (\$ in Thousands):
 - (U) \$4,604 Funds the acquisition of Foreign Materials IAW the prioritized Air Force Foreign Material Acquisition list; subject to assets availability.
 - (U) \$ 957 Funds the exploitation of acquired Foreign Materials IAW prioritized lists and specific exploitation plans.
 - (U) \$ 578
 Funds the operations and maintenance of the specialized Foreign Material assets.
 - (U) \$6,139 Total

Project 7500 Page 11 of 12 Pages Exhibit R-2A (PE 0604256F)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0604256F Threat Simulator Develor	project 7500
(U) B. Project Change Summary - Description of Significant Changes:		
(U) Significant Program Changes: FY 2000 reductions to fund other Air Force requirements.		
(U) C. Other Program Funding Summary (\$ in Thousands) None.		
(U) D. Acquisition Strategy: Not applicable		
(U) E. Schedule Profile: Not applicable.		
Project 7500 Page	12 of 12 Pages Exh	ibit R-2A (PE 0604256F)